



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/734,228	12/15/2003	Takeshi Nakao	36856.1173	2323

54066 7590 08/31/2005

KEATING & BENNETT, LLP  
8180 GREENSBORO DRIVE  
SUITE 850  
MCLEAN, VA 22102

EXAMINER
----------

DOUGHERTY, THOMAS M

ART UNIT	PAPER NUMBER
----------	--------------

2834

DATE MAILED: 08/31/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

H.A

<b>Office Action Summary</b>	<b>Application No.</b> 10/734,228	<b>Applicant(s)</b> NAKAO ET AL.	
	<b>Examiner</b> Thomas M. Dougherty	<b>Art Unit</b> 2834	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 15 December 2003.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10, 15 and 16 is/are rejected.
- 7) ☒ Claim(s) 11-14 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 15 December 2003 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1203</u> . | 6) <input type="checkbox"/> Other: _____  |

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-8, 10, 15 and 16 are rejected under 35 U.S.C. 102(b) as being anticipated by Kadota et al. (US 6,185,801). Kadota et al. show (fig. 1) an end surface reflection type surface acoustic wave device comprising: a piezoelectric substrate (2) having two opposing end surfaces (2a, 2b) on which a surface acoustic wave is reflected; an electrode film (3) made of at least one of Al and an alloy including Al as a major component (col. 4, ll. 3-6) on said piezoelectric substrate and which defines at least one interdigital transducer (3a, 3b), and an insulating film (4) arranged on said piezoelectric substrate (2) so as to cover said electrode film (3); wherein a top surface of the insulating film (4) is planarized, and a ratio of the average density of said electrode film (3) to the density of the insulating film (4) is less than or equal to about 1.5.

Said insulating film is made of SiO<sub>2</sub>. See col. 4, ll. 30-34.

Said piezoelectric substrate is made of at least one of LiTaO<sub>3</sub> and LiNbO<sub>3</sub>.

When the wavelength of the surface acoustic wave is denoted as  $\lambda$  the film thickness  $H_s/\lambda$  of said insulating film made from SiO<sub>2</sub> is in the range of about 0.15 to about 0.40. See column 5, lines 18-24.

Art Unit: 2834

Said electrode film (3) defines one interdigital transducer (3a, 3b) and is a surface acoustic wave resonator.

Said end surface reflection type surface acoustic wave device is one of a resonator-type filter, a ladder-type filter, and a lattice-type surface acoustic wave filter.

Said end surface reflection type surface acoustic wave device is a one-port-type surface acoustic wave resonator.

The piezoelectric substrate has a substantially rectangular shape.

The at least one interdigital transducer includes a pair of comb electrodes.

The at least one interdigital transducer is made of Al (as noted).

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claim 9 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kadota et al. (US 6,185,801) in view of Sato et al. (US 6,236,141). Given the invention of Kadota et al. as noted above, they do not specifically note that their piezoelectric substrate is a 36° rotated Y-plate X-propagation LiTaO<sub>3</sub> substrate.

Sato et al. show (fig. 2) an end surface reflection type surface acoustic wave device comprising: a piezoelectric substrate (11) having two opposing end surfaces on

Art Unit: 2834

which a surface acoustic wave is reflected; an electrode film (13) as a major component on said piezoelectric substrate and which defines at least one interdigital transducer.

The piezoelectric substrate is a  $36^{\circ}$  rotated Y-plate X-propagation  $\text{LiTaO}_3$  substrate. See col. 5, ll. 17-22.

Sato et al. don't show Al or Al alloy electrodes, nor does they show an insulation layer.

It would have been obvious to one of ordinary skill in the art to employ the  $36^{\circ}$  rotated Y-plate X-propagation  $\text{LiTaO}_3$  substrate in the invention of Kadota et al. at the time their invention was made because it has known characteristics for such application as taught by Sato et al.

#### ***Allowable Subject Matter***

Claims 11-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is an examiner's statement of reasons for allowance: at a minimum, the prior art fails to show or fairly suggest and end-reflection surface acoustic wave device with a piezoelectric substrate, an interdigital electrode layer of aluminum or aluminum alloy and an insulation layer on the electrode layer further including with the piezoelectric substrate sides having step differences at a position of a middle height.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably

Art Unit: 2834

accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

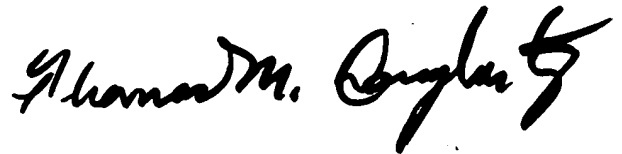
**Conclusion**

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. The remaining prior art cited reads on some aspects of the claimed invention.

Direct inquiry to Examiner Dougherty at (571) 272-2022.

tmd  
tmd

September 30, 2004



THOMAS M. DOUGHERTY  
PRIMARY EXAMINER  
GROUP 2834